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FarmFacts

Produced by Saskatchewan Agriculture and Food and Saskatchewan Rural Development

Wheat Midge Monitoring and Economic Threshold

For chemical controls to be effective, insecticide sprays must be applied at the correct time in relation to crop development and adult midge activity. To obtain this information, producers must inspect their wheat fields on a daily basis when the crop is vulnerable to midge attack. Spring wheat becomes vulnerable to the egg-laying females as soon as the wheat heads begin to emerge from the boot (Figure 2) and remains susceptible until pollination is complete (Figure 6). Given the variability in times of head emergence and pollination in the primary and tillering heads, wheat seeded at 1-1/2 bu/acre in 1985, 1986 and 1987 was vulnerable to the midge for 10-18 days.

The simplest and most accurate monitoring method is to inspect wheat fields each evening **throughout the entire susceptible period.** These inspections should be carried out between 8:00 p.m. and 10:00 p.m. when the midge females are most active around the wheat heads. However, egg-laying activity during this period will generally not occur if the wind speed is greater than 10 km/h (6 mph), if the air temperature is less than 15°F (59°F), or if it is raining.

When conditions favour egg-laying, estimates of the midge population can be obtained by counting the number of midge present on the wheat heads, relative to the total number of heads observed. **If, on average, more than one midge is seen on every 4-5 wheat heads, an insecticide spray is recommended.** In each field, several dozen heads should be inspected in at least three or four locations.

Timing of Spray Application

1. FURADAN/CYGON - Because Furadan and Cygon provide relatively poor control of eggs present on the wheat heads, the products should be applied within 24 hours after the midge threshold is reached. When applied in this manner, the products will control midge adults by direct contact and residual action. However, if adult midge persist 3 - 7 days after the first application and the crop is still vulnerable to egg-laying, a second spray may be required.

2. LORSBAN - Lorsban has a wider application window than either Furadan or Cygon. Because the product controls the eggs or young midge larvae before they cause detectable kernel damage, Lorsban applications can be delayed for up to 4 days after the midge threshold is reached. Field trials over the past three years have indicated that the optimal crop stage to apply Lorsban is when 70% of the wheat heads have emerged from the boot. When Lorsban is applied at this stage, a second spray will not be required. If Lorsban sprays are delayed until 90% head emergence or when flowering is completed (Figure 6), grade and/or yield improvements decline drastically.

For all registered products, sprays should be applied in the late afternoon or evening when temperatures exceed 15° and the wind speed is less than 10 km/h. Tests have indicated that sprays applied in the evening, when adult midge are around the wheat heads, provide better kernel protection than those applied at other times of the day.

Application Methods

To obtain the full benefits from insecticide sprays, thorough coverage of the wheat heads is essential, especially with Lorsban. In general, application methods which improve the uniformity and amount of spray deposited on the wheat heads, provide better kernel protection and subsequent grade or yield improvements. Factors which influence spray coverage include the following:

Fig.1

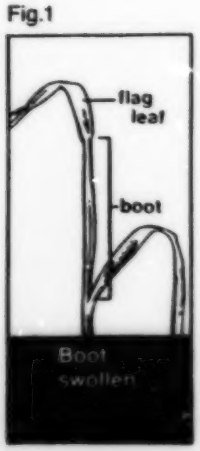


Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

- **Water Volume** - for both aerial and ground applications, sprays applied with higher water volumes provide better coverage and kernel protection than those applied with lower water volumes.

  Air: 18.7-37.4 litres/hectare (2.0-4.0 U.S. gal/A)
  Ground: 50-100 litres/hectare (4.4-8.9 Imp. gal/A)
- **Spray Boom Height** - for each nozzle type, maintain recommended boom height above the crop canopy.
- **Nozzle Tips** - flat fan (F) nozzle tips which produce fine spray droplets provide better coverage than low pressure (LP) tips which produce larger droplets.
- **Nozzle Orientation** - nozzles directed forward at a 45° angle will improve coverage on wheat heads.
- **Spray Pressure** - higher volume ground sprays (100 l/ha) should be applied at 240-275 kPa (35-40 psi). These pressures are required to obtain finer droplets and more uniform coverage.
- Do not apply to areas where bees are actively foraging or near apiaries, as product is toxic to bees.
- Observe "Minimum Days to Harvest" (Table 1) before grazing livestock on sprayed forage.
- All 3 insecticides are potentially hazardous to your health. Full protective clothing, respirators and goggles must be worn during all phases of pesticide mixing and application.

READ THE PESTICIDE LABEL BEFORE USING.

For more information, consult your local Extension Agrologist.

Table 1. Additional Chemical Information

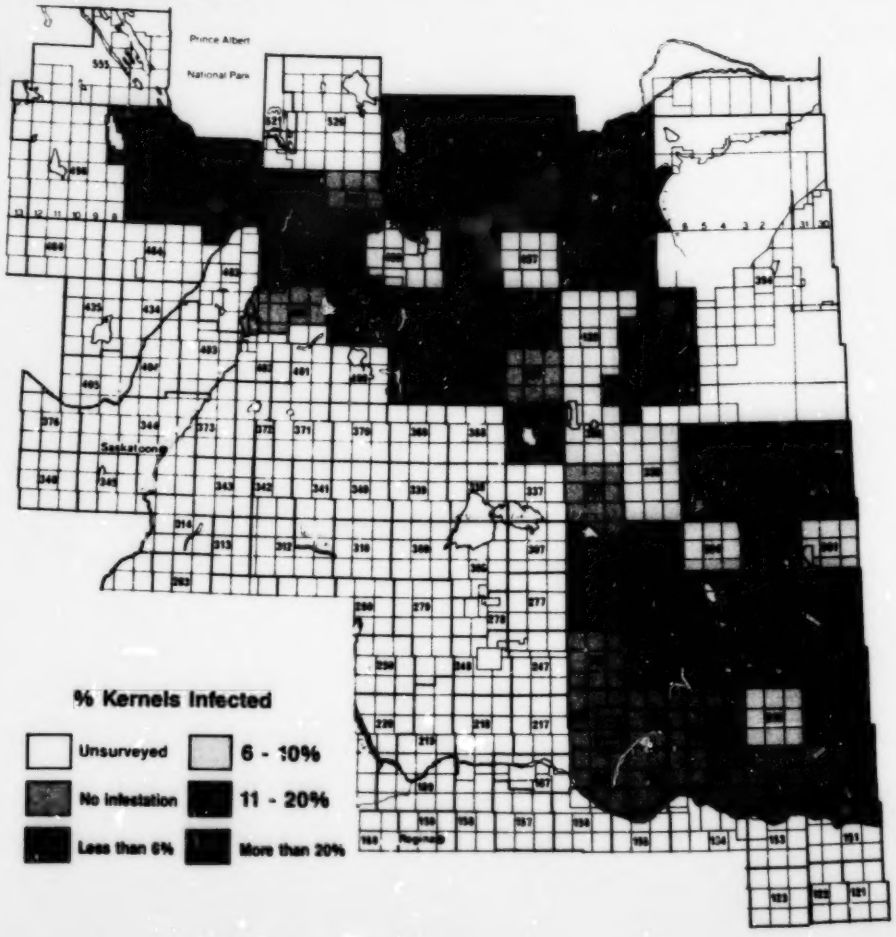
Trade Name (Common Name)	Application Rate Ground	Application Rate Aerial	Approximate Cost	Container Size	Minimum Days Before Harvest	Toxicity Rating* of Formulated Product Oral LD_{50} (DERMAL LD_{50})
LORSBAN 4E (Chlorpyrifos)	835 ml/ha (340 ml/A)	1000 ml/ha (405 ml/A)	$5.00/A-$5.80/A	2 x 10 L	60	272 (>2000)
FURADAN 480F (Carbofuran)	275 ml/ha (111 ml/A)	275 ml/ha (111 ml/A)	$2.35/A	4 L	21	19 (6800)
CYGON 480 EC (Dimethoate)	1.0 L/ha (405 ml/A)	1.0 L/ha (405 ml/A)	$3.90/A	205 L 2 x 10 L	21	340-440 (>2400)

* The lower the LD_{50} number, the more toxic the compound.

Wheat Midge Infestation

Note: Data for this map was compiled by Agriculture Canada from soil samples collected in September, 1989. The density of cocoons which may result in economic damage is estimated at approximately 700 per square meter.

Caution: Midge density is typically very sporadic with large differences in infestations sometimes occurring in adjacent fields. Prevailing weather conditions in 1990 may influence midge reproduction and survival. Therefore, adult midge infestations may not coincide with these survey data.



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